


PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference HM/KP/8340INT	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/GB2004/000019	International filing date (day/month/year) 06.01.2004	Priority date (day/month/year) 09.01.2003
International Patent Classification (IPC) or national classification and IPC A61H1/02		
Applicant HANKIN, Philip Raymond		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 11 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 15 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input checked="" type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input checked="" type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand 06.08.2004	Date of completion of this report 14.04.2005	
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**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/GB2004/000019

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

5, 7, 8, 13	as originally filed
1, 1a, 2-4, 6, 9-12	received on 20.11.2004 with letter of 17.11.2004

Claims, Numbers

1-22	received on 20.11.2004 with letter of 17.11.2004
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Drawings, Sheets

1/5-5/5	as originally filed
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- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☒ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☒ the claims, Nos. 23-31
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☒ the description, pages 1, 1a, 2, 6, 9, 10
 - ☒ the claims, Nos. 1
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/GB2004/000019

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:
- ☐ the entire international application,
 - ☒ claims Nos. 21, 22 (in part)
because:
 - ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):
 - ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
 - ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
 - ☒ no international search report has been established for the said claims Nos. 21, 22 (in part)
 - ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
 - the written form ☐ has not been furnished
 - ☐ does not comply with the standard
 - the computer readable form ☐ has not been furnished
 - ☐ does not comply with the standard
 - ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.
 - ☐ See separate sheet for further details

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/GB2004/000019

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	19, 22
	No: Claims	1-18, 20
Inventive step (IS)	Yes: Claims	
	No: Claims	1-20, 22
Industrial applicability (IA)	Yes: Claims	1-20, 22
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item I

Basis of the opinion

The amendments filed with the letter dated 17.11.2004 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT. The amendments concerned are the following:

1. The applicant has introduced into **claim 1** the passage "so that the **weight** of that limb **causes** the compressive engagement with the grip to allow the grip under compression to deform about an engaging portion of a user's limb for a **non-slip association** between them **without any requirement to clench** a part of the exerciser".

Neither has the applicant provided any basis in the application as filed for the introduction of this passage, nor could any basis be found. On the contrary, the original application documents clearly disclose only the following possibilities to achieve a non-slip engagement between the user's limb and the grip:

- a) The material of the grip can be selected to provide non-slip properties (page 5, lines 19-22).
- b) A "high user skin surface to grip contact area" (page 8, lines 6, 7) can be provided.
- c) A specific shape of the grip can be provided (page 3, lines 1-3).
- d) The grip can be "formed from pliable material such as PVC material or a rubber or a foam mesh such that the grip will be deformed into even greater snug fit around the contour of a user's limb or joint as required" (page 9, lines 27-30).

The **causality** that it is the weight of a single limb that causes compression and deformation of the grip to establish non-slip association between grip and limb has no basis whatsoever in the originally filed application, which is totally silent about any "weight" of a limb, let alone any "requirements to clench". The only passage of the original application documents that deals with a deformation of the grip is the one cited above in connection with possibility d). This passage, however, is concerned with the embodiment according to Fig. 10 and clearly teaches that - **in addition** to adapting the shape of the grip to the anatomy of the limb - the grip can be "formed

from a pliable material ... such that the grip will be deformed into **even greater** snug fit around the contour of a user's limb", i.e. deformed into even greater snug fit than compared to the embodiment according to Fig. 10 where the grip is cup-shaped to fit the limb. Thus, even this passage cannot be used to deduct anything more than the fact that the grip may be pliable or deformable.

As a consequence, the amendments of claim 1, which result in the claim to now encompass also embodiments in which the non-slip association is **solely** achieved by the weight of the limb that compresses and deforms the grip (such as e.g. embodiments in which the **grip is shaped by the weight** of the limb), go beyond the disclosure of the application as filed.

Therefore, this report has been established **disregarding** the above mentioned passage "so that the weight of that limb causes the compressive engagement with the grip to allow the grip under compression to deform about an engaging portion of a user's limb for a non-slip association between them without any requirement to clench a part of the exerciser" in **claim 1** (Rule 70.2(c) PCT).

2. The applicant has further introduced the following amendments into the description without indicating any basis, and without there being any basis in the application as filed:
 - 2.1 Page 1, last line - page 1a, line 4 comprises the same passage of claim 1 as indicated above in item 1.1.
 - 2.2 There is no basis for the feature that the elastomeric material may be "a medically approved foam based disposable material", page 2, lines 23, 24.
 - 2.3 The applicant has introduced on page 2, lines 32, 33 the feature that "the skid incorporates a cushioning material between the grip **surface** and the slide surface", whereas according to the application as filed the cushioning material is positioned between the grip as such (and not only the grip surface) and the slide surface (see e.g. original page 2, lines 30-31). Thus, the application now contains subject-matter which extends beyond the content of the application as

filed.

- 2.4 There is no basis for replacing the feature "elbow" by the feature "hand" on page 6, line 33 and page 9, lines 26-28.

Likewise, there is no basis for replacing the feature "elbow" by the feature "shoulders" on page 10, line 11.

- 2.5 There is no basis for generalizing the feature "foam mesh" by the feature "foam" on page 9, line 30. The use of a foam in a form other than a foam mesh has not been originally disclosed.

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

Original claim 21 has not been searched, and original claim 21 has been searched if it were dependent directly on claim 1. Since present **claims 21, 22** are based on original claims 21, 22, no opinion is established on the subject-matter of claim 21 and claim 22 is examined as if it were dependent directly on claim 1.

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

I. Documents

Reference is made to the following documents:

- D1: US-A1-2002 0082150;
- D2: US-A1-2002 0183661;
- D3: GB-A-1 112 697;
- D4: DE-A-2 244 005;
- D5: US-A1-2002 0128134;
- D6: US-A-5 730 690;
- D7: DE-A-1 936 435;

D8: US-A-3 622 172;
D9: US-A-1 824 920;
D10: US-A-2001/0006926;
D11: US-A-1 982 843;
D12: DE-A-2 322 211;
D13: DE-U-201 18 063.

II. Requirements of Article 6 PCT - Clarity

The application does not meet the requirements of Article 6 PCT for the following reasons:

1. Claim 1 is directed to an exerciser comprising a slide surface, whereby a user can perform slide motions. The embodiment according to Figs. 11-13, however, is directed to an exerciser comprising roller means for rotation upon a floor. As consequence, there is inconsistency between the claims and the rest of the application (see also PCT International Search and Preliminary Examination Guidelines item 5.29).
2. The term "by **compressing deformative** engagement" used in **claim 1** is not clear.
3. The term "grip for gripping a user's limb" is not clear, since it appears that it is rather the user that grips a grip than vice versa. It is noted that no "active" grip has originally been disclosed.
4. The formulation "for **specifically** exercising that limb" in claim 1 is not clear: Any exerciser having a grip to rest a limb upon in order to move the exerciser is adapted and intended to exercise that limb. Thus, it is not clear which additional structural feature is intended to be defined by the introduction of that formulation.

Remark:

It is noted that the formulations used in **claim 1** such as "exerciser **for** physiotherapy", "**for** gripping", or "whereby a user **can** perform oscillatory slide motions" are only interpreted as the indication of an intended use and not as a definition of distinctive structural features. These formulations are to be construed as

meaning merely that the exerciser is suitable for this use (see also PCT International Search and Preliminary Examination Guidelines item 5.23).

III. Requirements of Article 33(2), (3) PCT - Novelty / Inventive step

1. Document D10 discloses (see Figs. 1-3) (the references in parentheses applying to this document):

An exerciser for physiotherapy (the known device is suitable as such for this intended use, i.e. without any structural change), the exerciser comprising a skid (1) with a slide surface (3) upon one side and a grip ((2); paragraph [0018]) for gripping a user's limb in use by compressing deformative engagement (see lines 5-7 of paragraph [0016]: use of "soft, compressible material such as ... PVC". See also lines 6, 7 of paragraph [0018]: use of rubber to provide a non-slip grip; compressibility and deformability are intrinsic material properties of rubber. Compare this disclosure of D1 with the choice of material according to the present application, original page 9, lines 27, 28) upon the other side of the skid whereby a user can perform oscillatory slide motions in use by placing a single limb upon the grip (again: the known exerciser is suitable as such for this type of use) for specifically exercising that limb about a joint by slide motions (inevitable effect of using the known exerciser).

Since the subject-matter of **claim 1** does not differ therefrom, it is not novel (Article 33(2) PCT).

2. The subject-matter of **claim 1** likewise is not new (Article 33(2) PCT) over the exerciser according to document D1 (see esp. Figs. 1-7): The exerciser comprises a slide surface (50, 66), the user **can** rest e.g. a hand upon grip (46) and **can** perform oscillatory slide motions. Grip ("hand pad" (46); paragraph [0040]) likewise is compressible and deformable (otherwise item (46) would not be a "hand **pad**"). Thus, the device according to D1 comprises all structural features of the presently claimed device, and can be used without any structural change in the same way as claimed.
3. The subject-matter of **claim 1** not inventive (Article 33(3) PCT) in view of the combined teaching of D13 and D10: Document D13 discloses (cf. esp. Fig. 3 and e.g. page 2, lines 29-35) an exerciser from which the subject-matter of claim 1 only differs

in that "compressing deformative engagement" between the grip (2) and the user's limb is possible. Therefore, the problem to be solved by the present application can be seen in providing means for improving engagement between the limb and the grip. However, these features have already been employed for the same purpose in a similar exerciser, see document D10, lines 5-7 of paragraph [0016] and lines 6, 7 of paragraph [0018]: use of a compressible material such as rubber to prevent sliding. It would be obvious to the person skilled in the art, namely when the same result is to be achieved, to apply these features with corresponding effect to an exerciser according to document D13, thereby arriving at an exerciser according to claim 1.

4. Dependent **claims 2-20, 22** do not contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, since all additional features are either explicitly disclosed in at least one of the documents D1, D10 or just relate to normal design procedures in this field (the references in parentheses applying to the respective document):

Claims 2-4: See e.g. D1, Fig. 6; D10, Fig. 1; D13, Fig. 3.

Claims 5, 7: See e.g. D10, paragraph [0016]: The exerciser is formed from a plastics material. The skid being a unitary moulding is standard. See likewise e.g. D4, page 6, paragraph 3.

Claims 6, 8: See e.g. D10, Fig. 1: This known skid likewise is "stamped or machined to provide an appropriate shape" - whichever feature this definition may imply. This skid made of e.g. PVC is also "rendered suitable for heat sterilisation".

Claims 9-12: See especially D1: inserts (38, 42, 46). It is noted, that any insert is "disposable". The term "specifically shaped for a user's requirements in terms of the limb used or exercise made" does not imply any feature which is not likewise fulfilled by the inserts (38, 42, 46) of D1.

Claim 13: Cf. for example D10, paragraph [0018].

Claim 14: See e.g. D1, Fig. 1; D10, Fig. 2; D13, page 6, lines 23, 24.

Claims 15, 16: Reference is made especially e.g. to D10, paragraph [0018].

Claims 17, 18: See e.g. D1, Figs. 1-7; D10, Fig. 1; D13, Fig. 3.

Claim 19: It is nothing out of the ordinary to provide a cushioning material.

Claim 20: See e.g. D10, Figs. 1, 3 and paragraphs [0008] and [0019]: ribs/keels (4).

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

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Claim 22: Cf. esp. D13, Fig. 3.

Exerciser

The present invention relates to exercisers and more particularly, but not exclusively, to exercisers used for physiotherapy and circulatory exercise by
5 bedridden and after-care patients.

After certain orthopaedic surgery, it is necessary to progressively rebuild confidence, strength and mobility in the affected body part. For example, with knee surgery it is necessary to stimulate progressive bending of a patient's knee
10 without over straining that knee. It will also be understood that such exercise will generally occur at least initially whilst the patient is still bedridden.

Previously, a so-called "rehab" board has been used for the above exercise. This "rehab" board essentially comprises a flat wooden board or panel
15 placed upon the patient's bed and a doughnut or ring bandage is then formed within which a patient's heel is placed in order that the leg can be bent by sliding the doughnut to and fro along the board to gradually increase flexibility and strength. Clearly, carrying a hefty wooden board and forming a ring or doughnut bandage for each patient is cumbersome and time consuming.

20 In addition to exercises with respect to knee and hip replacement, it will also be understood that various patients with respect to recovery from other limb surgery, strokes, forms of orthopaedic surgery and fractures also require at least initially gentle exercise in order to initiate a recovery process. Furthermore, in
25 post operative rehabilitation, the exercisers will also have applications for general exercise routines, i.e. utilising tension bands around the foot or limb whilst stretching to increase muscle growth, etc. There is also a requirement for a readily transportable exerciser for general exercise during spare or leisure time.

30 In accordance with the present invention there is provided an exerciser for physiotherapy, the exerciser comprising a skid with a slide surface upon one side and a grip for gripping a user's limb in use by compressing deformative engagement upon the other side of the skid whereby a user can perform oscillatory slide motions in use by placing a single limb upon the grip so that the

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weight of that limb causes the compressive engagement with the grip to allow the grip under compression to deform about an engaging portion of a user's limb for a non-slip association between them without any requirement to clench a part of the exerciser for specifically exercising that limb about a joint by slide motions.

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Preferably, the slide surface is flat. Alternatively, the slide surface is curved. Furthermore, the slide surface may be curved in a side to side or front to back or both directions.

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Typically, the skid is a unitary moulding. Alternatively, the skid may be stamped or machined to provide an appropriate shape.

Generally, that moulding is formed from a plastics or metal material.
10 Normally, the skid would be rendered suitable for heat sterilisation.

The skid may include an insert to provide the grip surface. Possibly, the insert is disposable. Advantageously, the insert can be specifically shaped for a user's requirements in terms of the limb used or exercise required. A number of
15 different insert shapes may be secured to or moulded into the skid in order to provide the present exerciser. Alternatively, the skid may be a dimpled or cross-hatched or have a ribbed surface to provide the grip surface.

The skid may have a generally round, oblong, polygon or rectangular
20 shape.

The grip may be provided by a non-slip elastomeric material. Typically, that elastomeric material may be a medically approved foam based disposable material.

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Preferably, the skid has an upturned curved rim away from the slide surface to prevent snagging of the exerciser during use.

Advantageously, the upturned rim provides a dished configuration for the
30 skid which cooperates with the grip in use.

Possibly, the skid incorporates a cushioning material between the grip surface and the slide surface.

Possibly, the slide surface includes guide ribs or keels to facilitate a
35 preferred direction of slide for the exerciser.

Possibly, the grip surface is shaped to reciprocally engage a limb contour. Typically, the grip surface is shaped to include an open aspect to receive an
5 Achilles tendon of an ankle or palm of a hand.

Embodiments of the present invention will now be described by way of example only with reference to the accompanying drawings in which:

10 Fig. 1 is a schematic illustration of an exerciser in use in accordance with the present invention;

Fig. 2 is a schematic cross-section of a first embodiment of an exerciser in accordance with the present invention.

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Fig. 3 is a schematic plan view of the exerciser depicted in Fig. 2;

Fig. 4 is a bottom view of a first exerciser refinement;

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Fig. 5 is a side view of the exerciser depicted in Fig. 4;

Fig. 6 is a schematic plan view of a second embodiment of an exerciser in accordance with the present invention;

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Fig. 7 is a schematic bottom view of a second exerciser refinement;

Fig. 8 is a schematic front view of the exerciser depicted in Fig. 5;

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Fig. 9 is a side view of an exerciser in use; and,

Fig. 10 is a schematic plan view of an exerciser in accordance with the present invention in which the grip is shaped to reciprocally engage a particular limb contour of a potential user:

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Fig. 1 is a schematic illustration of an example of use of an exerciser 1 in accordance with the present invention. Thus, a user 2 in this case places their heel 3 upon the exerciser 1 in order to bend and flex their knee 4 by slide motions in the direction of arrow heads A. The exerciser 1 and for that matter the user 2 will generally be lying upon a bed 5. In these circumstances, the user 2 can exercise their knee 4 by using the exerciser 1 without leaving their bed 5. The user 2 is thus able to improve flexibility with regard to the knee 4 as well as strength progressively in accordance with their own conditions and capabilities.

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Fig. 1 illustrates the exerciser 1 in accordance with the present invention for use principally with regard to exercising a knee 4. However, it will be understood that there are a number of situations where gentle oscillatory motion is required in order to progressively improve flexibility and strength within a

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In Figures 2 and 3 the exerciser 21 is substantially round and in the shape of a saucer. This shape again resists snagging with bed sheets and mattress surfaces. However, it will be understood that other shapes including oblong, rectangular and polygons could be used provided any corners are appropriately chamfered, smoothed or otherwise shaped to resist snagging.

As illustrated in Figs. 2 and 3 the grip 23 and where used the non-slip layer 27 may be wholly confined within the hollow created by the skid 22. In such circumstances, the grip 23 may be secured to the skid 22 through an adhesive or other mechanism such as a hook and fleece/Velcro fastening. Alternatively, the grip 23 may be sized such that it is in a compression fit within the hollow of the skid 22.

Hygiene is of particular importance with regard to exercising. Thus, the present exerciser 21 can be designed as a unitary moulding such that all of the components, that is to say skid 22 and grip 23 can be sterilised by appropriate heating to an elevated temperature and/or washing in a sterilising solution. For example, the skid 22 may be made from a heat resistant plastic material where necessary or a metal. An alternative approach to achieving hygienic use is to provide that the grip 23 and where used the non-slip layer 27 are an insert placed within the hollow of the skid 22 as required. In such circumstances, the grip 23 would be removed after each exercise session and a new grip 23 provided for the next patient or next exercise session. These inserts may be disposable or cleanable/sterilisable themselves.

It will be understood that generally, being of a robust nature the skid 22 can be formed from a range of materials which are more readily sterilisable than the grip 23 and so provision of an insert may avoid unacceptable material compromises in order to enable a unitary moulding to be provided which can be wholly sterilised. It will also be understood that a range of grip 23 inserts for differing patient requirements in terms of heel, hand or limb size as well as exercise required could be provided whilst using the same skid 22.

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located in a non-slip engagement. Thus, the whole exerciser 91 oscillates in the direction of arrow heads 96 in order to provide the desired exercise. The exerciser 91 oscillates in the direction of arrowheads 96 upon a surface 97 which in view of the desired foot exercise will typically be a floor or similar surface 97.

Referring to Fig. 10 depicting a schematic plan view of an exerciser 100 in which a grip portion 101 is shaped to reciprocate the contours of an expected user's limb. Thus, as previously the exerciser 100 generally incorporates a raised lip 102 about it's periphery in order to create a smooth curvature at that periphery to avoid snagging during slide motions. The other side of the exerciser 100 to that of the grip 101 has a slide surface as described previously. In such circumstances the exerciser 100 can slide as required, and if that slide surface includes guide ribs or keels the direction of that slide motion may be controlled.

The grip 101 as indicated is shaped to meet the contours of an expected user's limb. In the particular embodiment depicted in Fig. 10, that contour portion of a user's limb is their ankle. Thus the grip 101 has a cupped shape to accept a user's heel with a depressed central region surrounded mostly with a raised lip 103 but incorporating an opening 104 within which the user's Achilles tendon is accommodated. In such circumstances in use a user's ankle is seated within the grip 100 snugly to allow ready exercising by gentle sliding motions as described above. Clearly, the actual depth of the central region and lip 103 will be dependent upon particular requirements for snug seating. Similarly, a grip used for a hand may incorporate instead of a deep opening 104 for an Achilles tendon simply less raised sections opposite each other in the raised lip to accommodate a user's forearm with the palm of the hand seated snugly, etc in the grip. It will also be understood that the grip will also tend to be formed from pliable material such as a plastic material or rubber based or a foam such that the grip will be deformed into even greater snug fit around the contour of a user's limb or joint as required.

As indicated above the present invention particularly relates to exercisers for use with respect to rehabilitation after orthopedic surgery. However, as also
5 indicated exercisers in accordance with the present invention may be utilised with respect to maintenance of some mobility despite infirmity or to enable muscle stimulation development and maintenance despite forced lack of ambularity.

As indicated previously, an exerciser in accordance with the present
10 invention can be used for a number of user limbs and joints including arms, shoulders, and leg movements without necessity of providing a heavy slide board and provision of a specific ring or doughnut bandage for each patient or user. In such circumstances, the present exerciser provides a more convenient means of achieving initial exercise after surgery or in other situations where gradual
15 recovery of mobility is required. Furthermore, due to its ready portability an exerciser can be easily transported to allow convenient spare time or leisure exercise for general fitness.

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Claims

- 5 1. An exerciser for physiotherapy, the exerciser comprising a skid with a slide surface upon one side and a grip for gripping a user's limb in use by compressing deformative engagement upon the other side of the skid whereby a user can perform oscillatory slide motions in use by placing a single limb upon the grip so that the weight of that limb causes the compressive engagement with the grip to
- 10 allow the grip under compression to deform about an engaging portion of a user's limb for a non-slip association between them without any requirement to clench a part of the exerciser for specifically exercising that limb about a joint by slide motions.
- 15 2. An exerciser as claimed in claim 1 wherein the slide surface is flat.
3. An exerciser as claimed in claim 1 wherein the slide surface is curved.
4. An exerciser as claimed in claim 3 wherein slide surface is curved in a side
- 20 to side direction or front to back direction or both directions.
5. An exerciser as claimed in any preceding claim wherein the skid is a unitary moulding.
- 25 6. An exerciser as claimed in any of claims 1 to 4 wherein the skid is stamped or machined to provide an appropriate shape.
7. An exerciser as claimed in any preceding claim wherein the skid is formed from a plastics or metal material.
- 30 8. An exerciser as claimed in any preceding claim wherein the skid is rendered suitable for heat sterilisation.
9. An exerciser as claimed in any preceding claim wherein the skid includes
- 35 an insert to provide the grip.

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10. An exerciser as claimed in claim 9 wherein the insert is disposable.
- 5 11. An exerciser as claimed in claim 9 or claim 10 wherein the insert is specifically shaped for a user's requirements in terms of the limb used or exercise required.

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12. An exerciser as claimed in any of claims 9 to 11 wherein a number of different insert shapes are secured to or moulded into the skid in order to provide the exerciser.

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13. An exerciser as claimed in any preceding claim wherein the skid may is a dimpled or cross-hatched or has a ribbed surface to provide the grip .

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14. An exerciser as claimed in any preceding claim wherein the skid is a generally round, oblong, polygon or rectangular shape.

15. An exerciser as claimed in any preceding claim wherein the grip is provided by a non-slip elastomeric material.

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16. An exerciser as claimed in claim 15 wherein that elastomeric material is a plastic or rubber based material.

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17. An exerciser as claimed in any preceding claim wherein the skid has an upturned curved rim away from the slide surface to prevent snagging of the exerciser during use.

18. An exerciser as claimed in claim 17 wherein the upturned rim provides a dished configuration for the skid which cooperates with the grip surface in use.

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19. An exerciser as claimed in any preceding claim wherein the skid incorporates a cushioning material between the grip and the slide surface.

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20. An exerciser as claimed in any preceding claim wherein the slide surface includes guide ribs or keels to facilitate a preferred direction of slide for the exerciser.

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21. An exerciser as claimed in any preceding claim wherein the grip has a recess shaped for engagement about a limb contour of a user, the recess comprising a depression in the grip as presented to a limb of a user in order to facilitate a non-slip association between the grip and a portion of a limb of a user.

22. An exerciser as claimed in claim 21 wherein the grip is shaped to include an open aspect to receive an Achilles tendon of an ankle or hand.

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